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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|---|---|---|---|---|
| 09/669,862 | 09/26/2000 | Ernest F. Hasselbrink JR. | SD-8289 | 5130 |

20567 7590 03/29/2005

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| EXAMINER | |
|---|---|
| NOGUEROLA, ALEXANDER STEPHAN | |

| ART UNIT | PAPER NUMBER |
|---|---|
| 1753 | |

DATE MAILED: 03/29/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

| Office Action Summary | Application No. | Applicant(s) | |
|---|---|---|---|
| | 09/669,862 | HASSELBRINK ET AL. | |
| | Examiner | Art Unit | |
| | ALEX NOGUEROLA | 1753 | |

*-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --*

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

1)☒ Responsive to communication(s) filed on *24 January 2005*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

4)☒ Claim(s) *1-5, 10-14, 19-23, and 28-31* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-5,10-14,19-23 and 28-31* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

**Application Papers**

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *24 January 2005* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

## DETAILED ACTION

### *Status of Objections and Rejections pending since the Office action of August 19, 2004*

1. The objection to the drawings are withdrawn.

2. The rejection of claims 2, 11, and 19-27 under 35 U.S.C. 112, second paragraph, are withdrawn.

3. The rejection of claims 1, 2, 6, 8-11, 15, 17-20, 24, and 26-29 under 35 U.S.C. 102(e) as being clearly anticipated by Griffiths et al. are withdrawn, but have been rewritten below.

4. The rejection of claims 7, 16, and 25 under 35 U.S.C. 103(a) as being obvious over Griffiths et al. in view of Chow et al. are withdrawn, but have been rewritten below.

### *Response to Arguments*

5. Applicant's arguments with respect to claims 1, 2, 6, 8-11, 15, 17-20, 24, and 26-29 have been considered but are moot in view of the new grounds of rejection. The rejections based on

Griffiths have been rewritten to more clearly point out the features that read on the claimed invention.

6. The indicated allowability of claims 3-5 and 12-14 is withdrawn in view of the newly discovered references to Griffiths (US 6,270,641 B1), Christel (US 6,368,871 B1), and Manz (US 6,540,896 B1). Rejections based on the newly cited reference(s) follow.

***Claim Rejections - 35 USC § 102***

7. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

8. Claims 1, 10, 19, and 28-31 are rejected under 35 U.S.C. 102(e) as being anticipated by Griffiths et al. (US 6,270,641 B1) ("Griffiths").

Addressing claim 1, Griffiths discloses a microfluidic device (abstract) for reducing sample dispersion (abstract), comprising

a microchannel system disposed on a substrate (col. 6:37-64), the microchannel system comprising at least two microchannels joined together to form a junction at their intersection (Figures 12, 13, 15, and 16), wherein at least one of the microchannels has a reduced cross-

sectional area proximate the junction that is less than the cross-sectional area of the junction (Figures 12. 13, 15, and 16). Note that barring a contrary showing where the junction ends is essentially arbitrary. As an example, a marked copy of Figure 13 of Griffiths is provided below with the junction identified, the cross section of the junction identified, and a microchannel having a reduced cross-sectional area proximate the junction that is less than the cross-sectional area of the junction.

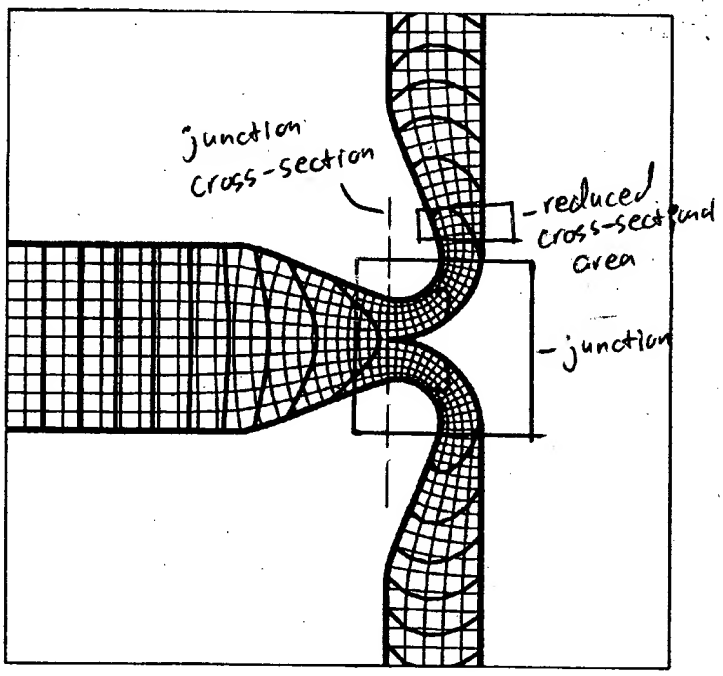


**FIG. 13**

Addressing claim 10, Griffiths discloses a device for reducing sample dispersion (abstract) comprising

a first and second microchannel disposed on a substrate and intersecting to form a junction, wherein at least one of the first and second microchannels has a region of reduced effective cross-sectional area proximate the junction. See Figures 12, 13, 15, and 16. Note that barring a contrary showing where the junction ends is essentially arbitrary. As an example, a marked copy of Figure 13 of Griffiths is provided above (rejection of claim 1) with the junction identified, the cross section of the junction identified, and a microchannel having a reduced cross-sectional area proximate the junction that is less than the cross-sectional area of the junction.

Addressing claim 19, Griffiths discloses a device for eliminating sample dispersion at microchannel junctions (abstract) comprising

a first and a second branching junction, therein each branching junction has one inlet channel and two outlet channels and wherein the inlet channels of the first and second branching junctions are joined together to form a junction and wherein each of the outlet channels is provided with a region of reduced cross-sectional area proximate the junction. See Figures 15 and 16 and also Figures 12 and 13 which show magnified views of junctions. Note that barring a contrary showing where the junction ends is essentially arbitrary. As an example, a marked copy of Figure 13 of Griffiths is provided above (rejection of claim 1) with the junction identified, the

cross section of the junction identified, and a microchannel having a reduced cross-sectional area proximate the junction that is less than the cross-sectional area of the junction.

Addressing claim 28, Griffiths discloses a method for controlling sample dispersion (abstract) comprising

providing a microchannel system, the microchannel system comprising

a substrate having at least two microchannels disposed thereon (col. 6:37-64 and Figures 12, 13, 15, and 16), wherein the microchannels intersect to form at least one junction (Figures 12, 13, 15, and 16); and

modifying at least one microchannel to produce at least one region of reduced cross-sectional area proximate the junction (this step is implied since such a region is present in the embodiments shown in Figures 12, 13, 15, and 16). Note that barring a contrary showing where the junction ends is essentially arbitrary. As an example, a marked copy of Figure 13 of Griffiths is provided above (rejection of claim 1) with the junction identified, the cross section of the junction identified, and a microchannel having a reduced cross-sectional area proximate the junction that is less than the cross-sectional area of the junction.

Addressing claim 29, Griffiths discloses reducing the geometric cross-sectional area (Figures 12, 13, 15, and 16) and filling the microchannel with a porous material or packing the microchannel wither structured particles (col. 6:2-4 and col. 7:24-51).

Addressing claim 30, for the limitations of this claim see the abstract and Figure 14.

Addressing claim 31, for the limitations of this claim see Figures 12 and 13. Note that barring a contrary showing where the junction ends is essentially arbitrary. As an example, a marked copy of Figure 13 of Griffiths is provided above (rejection of claim 1) with the junction identified, the cross section of the junction identified, and a microchannel having a reduced cross-sectional area proximate the junction that is less than the cross-sectional area of the junction.

9. Claims 1, 10, and 31 are rejected under 35 U.S.C. 102(e) as being anticipated by Christel et al. (US 6,368,871 B1) ("Christel").

Addressing claim 1, Christel discloses a microfluidic device (abstract), comprising

a microchannel system disposed on a substrate (Figures 1e and 1f), the microchannel system comprising at least two microchannels joined together to form a junction at their intersection (Figures 1e and 1f), wherein at least one of the microchannels has a reduced cross-sectional area proximate the junction that is less than the cross-sectional area of the junction (Figures 1e and 1f). Note that barring a contrary showing where the junction ends is essentially arbitrary. As an example a marked copy of Figure 1e of Christel is provided below with the junction identified, the cross section of the junction identified, and a microchannel having a reduced cross-sectional area proximate the junction that is less than the cross-sectional area of the junction. Note since the structure of the claimed device is otherwise the same as that

disclosed by Christel barring a contrary showing the preamble limitation that the device is for reducing sample dispersion and cross-contamination is only an intended use that does patentably distinguish the claimed device from that disclosed by Christel.

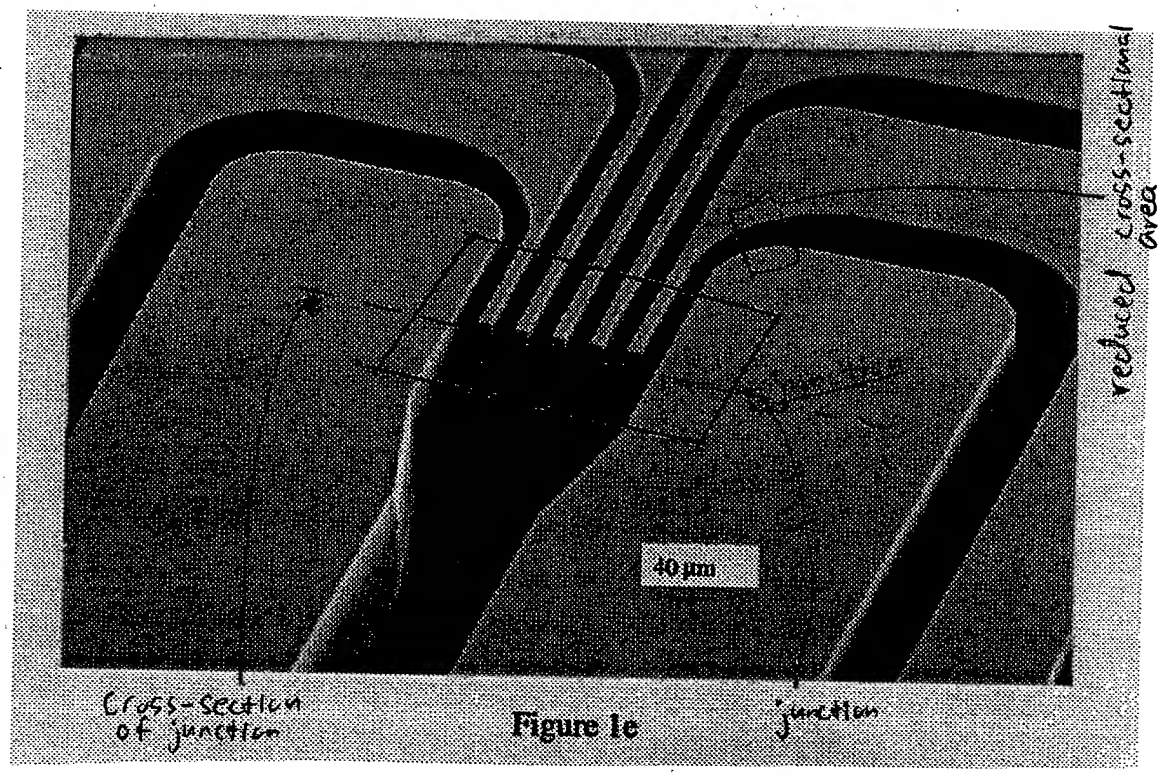


Figure 1e

Addressing claim 10, Christel discloses a device for reducing sample dispersion (abstract) comprising

a first and second microchannel disposed on a substrate and intersecting to form a junction, wherein at least one of the first and second microchannels has a region of reduced

effective cross-sectional area proximate the junction. See Figures 1e and 1f. Note that barring a contrary showing where the junction ends is essentially arbitrary. As an example, a marked copy of Figure 1e of Christel is provided above (rejection of claim 1) with the junction identified, the cross section of the junction identified, and a microchannel having a reduced cross-sectional area proximate the junction that is less than the cross-sectional area of the junction. Note since the structure of the claimed device is otherwise the same as that disclosed by Christel barring a contrary showing the preamble limitation that the device is for reducing sample dispersion and cross-contamination is only an intended use that does patentably distinguish the claimed device from that disclosed by Christel.

Addressing claim 31, for the limitations of this claim see Figures 1e and 1f. Note that barring a contrary showing where the junction ends is essentially arbitrary. As an example, a marked copy of Figure 1e of Christel is provided above (rejection of claim 1) with the junction identified, the cross section of the junction identified, and a microchannel having a reduced cross-sectional area proximate the junction that is less than the cross-sectional area of the junction. Note since the structure of the claimed device is otherwise the same as that disclosed by Christel barring a contrary showing the preamble limitation that the device is for reducing sample dispersion and cross-contamination is only an intended use that does patentably distinguish the claimed device from that disclosed by Christel.

10. Claims 1 and 10 are rejected under 35 U.S.C. 102(e) as being clearly anticipated by Manz et al. (US 6,540,896 B1) ("Manz").

Addresing claim 1, Manz discloses a microfluidic device (abstract), comprising

a microchannel system disposed on a substrate (abstract), the microchannel system comprising at least two microchannels (316b, 316a, and 318a) joined together to form a junction (304) at their intersection (Figure 3B), wherein at least one of the microchannels (316b, 316a, and 318a) has a reduced cross-sectional area proximate the junction that is less than the cross-sectional area of the junction (Figure 3b). Note since the structure of the claimed device is otherwise the same as that disclosed by Manz barring a contrary showing the preamble limitation that the device is for reducing sample dispersion and cross-contamination is only an intended use that does patentably distinguish the claimed device from that disclosed by Manz.

Addressing claim 10, Manz discloses a device for reducing sample dispersion (abstract) comprising

a first and second microchannel (316b, 316a, and 318a) disposed on a substrate and intersecting to form a junction, wherein at least one of the first and second microchannels has a region of reduced effective cross-sectional area proximate the junction. See Figure 3B. Note that barring a contrary showing where the junction ends is essentially arbitrary. Also note since the structure of the claimed device is otherwise the same as that disclosed by Manz barring a contrary showing the preamble limitation that the device is for reducing sample dispersion and cross-contamination is only an intended use that does patentably distinguish the claimed device from that disclosed by Manz.

***Claim Rejections - 35 USC § 103***

11. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

12. The factual inquiries set forth in *Graham* **v.** *John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

13. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

14. Claims 2-5, 11-14, and 20-23 are rejected under 35 U.S.C. 103(a) as being unpatentable over Griffiths et al. (US 6,270,641 B1) ("Griffiths").

Addressing claims 2 and 5, Griffiths discloses a microfluidic device (abstract) for reducing sample dispersion (abstract), comprising

a microchannel system disposed on a substrate (col. 6:37-64), the microchannel system comprising at least two microchannels joined together to form a junction at their intersection (Figures 12, 13, 15, and 16), wherein at least one of the microchannels has a reduced cross-sectional area proximate the junction that is less than the cross-sectional area of the junction (Figures 12. 13, 15, and 16). Note that barring a contrary showing where the junction ends is essentially arbitrary. As an example, a marked copy of Figure 13 of Griffiths is provided below with the junction identified, the cross section of the junction identified, and a microchannel having a reduced cross-sectional area proximate the junction that is less than the cross-sectional area of the junction.

Griffiths does not *mention* having the reduced effective cross-sectional area extend from the junction into the microchannel a distance of from about 05 to 4 microchannel, although Figures 12 and 13 appear to show the reduced effective cross-sectional area extend from the junction into the microchannel a distance of about 05 microchannel. Griffiths does not *mention* having the reduced effective cross-sectional area be about 10% that of the cross-sectional area of the microchannel. Barring evidence to the contrary such as unexpected results, the dimensions, such as lengths or cross-sectional areas, of the junction and proximate microchannel is just a matter of optimizing the junction to reduce sample dispersion. The length that the reduced effective cross-sectional area extends from the junction into the microchannel (or the cross-

sectional are of the reduced area) will depend, for example, on the angle of the turn in the junction or proximate microchannels and the cross-sectional area of the proximate microchannels.

Addressing claims 3 and 4, Griffiths discloses a microfluidic device (abstract) for reducing sample dispersion (abstract), comprising

a microchannel system disposed on a substrate (col. 6:37-64), the microchannel system comprising at least two microchannels joined together to form a junction at their intersection (Figures 12, 13, 15, and 16), wherein at least one of the microchannels has a reduced cross-sectional area proximate the junction that is less than the cross-sectional area of the junction (Figures 12. 13, 15, and 16). Note that barring a contrary showing where the junction ends is essentially arbitrary. As an example, a marked copy of Figure 13 of Griffiths is provided below with the junction identified, the cross section of the junction identified, and a microchannel having a reduced cross-sectional area proximate the junction that is less than the cross-sectional area of the junction.

Griffiths does not mention disposing a porous material in the embodiment shown in Figures 12, 13, 15, and 16; however, it would have been obvious to one with ordinary skill in the art at the time of the invention to do so because Griffiths discloses that the microchannel device may be used for "electrochromatographic and electrophoretic separations, as well as pressure-driven chromatographic separation" and that porous material is useful in performing these separations. See col. 6;2-4 and col. 7:24-49.

For claim 4 note that granular material such as chromatographic beads are structures and furthermore Griffiths states, "[a]lternatively, the separation matrix used to increase the surface area may be a small-scale pattern or array of obstacles fabricated within the channel." See col. 7:49-51.

Addressing claims 11 and 14, Griffiths discloses a device for reducing sample dispersion (abstract) comprising

a first and second microchannel disposed on a substrate and intersecting to form a junction, wherein at least one of the first and second microchannels has a region of reduced effective cross-sectional area proximate the junction. See Figures 12, 13, 15, and 16. Note that barring a contrary showing where the junction ends is essentially arbitrary. As an example, a marked copy of Figure 13 of Griffiths is provided above (rejection of claim 1) with the junction identified, the cross section of the junction identified, and a microchannel having a reduced cross-sectional area proximate the junction that is less than the cross-sectional area of the junction.

Griffiths does not *mention* having the reduced effective cross-sectional area extend from the junction into the microchannel a distance of from about 05 to 4 microchannel, although Figures 12 and 13 appear to show the reduced effective cross-sectional area extend from the junction into the microchannel a distance of about 05 microchannel. Griffiths does not *mention* having the reduced effective cross-sectional area be about 10% that of the cross-sectional area of the microchannel. Barring evidence to the contrary such as unexpected results, the dimensions, such as lengths or cross-sectional areas, of the junction and proximate microchannel is just a

matter of optimizing the junction to reduce sample dispersion. The length that the reduced effective cross-sectional area extends from the junction into the microchannel (or the cross-sectional are of the reduced area) will depend, for example, on the angle of the turn in the junction or proximate microchannels and the cross-sectional area of the proximate microchannels.

Addressing claims 12 and 13, Griffiths discloses a device for reducing sample dispersion (abstract) comprising

a first and second microchannel disposed on a substrate and intersecting to form a junction, wherein at least one of the first and second microchannels has a region of reduced effective cross-sectional area proximate the junction. See Figures 12, 13, 15, and 16. Note that barring a contrary showing where the junction ends is essentially arbitrary. As an example, a marked copy of Figure 13 of Griffiths is provided above (rejection of claim 1) with the junction identified, the cross section of the junction identified, and a microchannel having a reduced cross-sectional area proximate the junction that is less than the cross-sectional area of the junction.

Griffiths does not mention disposing a porous material in the embodiment shown in Figures 12, 13, 15, and 16; however, it would have been obvious to one with ordinary skill in the art at the time of the invention to do so because Griffiths discloses that the microchannel device may be used for "electrochromatographic and electrophoretic separations, as well as pressure-driven chromatographic separation" and that porous material is useful in performing these separations. See col. 6:2-4 and col. 7:24-49.

For claim 13 note that granular material such as chromatographic beads are structures and furthermore Griffiths states, "[a]lternatively, the separation matrix used to increase the surface area may be a small-scale pattern or array of obstacles fabricated within the channel." See col. 7:49-51.

Addressing claims 20 and 23, Griffiths discloses a device for eliminating sample dispersion at microchannel junctions (abstract) comprising

a first and a second branching junction, therein each branching junction has one inlet channel and two outlet channels and wherein the inlet channels of the first and second branching junctions are joined together to form a junction and wherein each of the outlet channels is provided with a region of reduced cross-sectional area proximate the junction. See Figures 15 and 16 and also Figures 12 and 13 which show magnified views of junctions. As an example, a marked copy of Figure 13 of Griffiths is provided above (rejection of claim 1) with the junction identified, the cross section of the junction identified, and a microchannel having a reduced cross-sectional area proximate the junction that is less than the cross-sectional area of the junction.

Griffiths does not *mention* having the reduced effective cross-sectional area extend from the junction into the microchannel a distance of from about 05 to 4 microchannel, although Figures 12 and 13 appear to show the reduced effective cross-sectional area extend from the junction into the microchannel a distance of about 05 microchannel. Griffiths does not *mention* having the reduced effective cross-sectional area be about 10% that of the cross-sectional area of the microchannel. Barring evidence to the contrary such as unexpected results, the dimensions,

such as lengths or cross-sectional areas, of the junction and proximate microchannel is just a matter of optimizing the junction to reduce sample dispersion. The length that the reduced effective cross-sectional area extends from the junction into the microchannel (or the cross-sectional are of the reduced area) will depend, for example, on the angle of the turn in the junction or proximate microchannels and the cross-sectional area of the proximate microchannels.

Addressing claims 21 and 22, Griffiths discloses a device for eliminating sample dispersion at microchannel junctions (abstract) comprising

a first and a second branching junction, therein each branching junction has one inlet channel and two outlet channels and wherein the inlet channels of the first and second branching junctions are joined together to form a junction and wherein each of the outlet channels is provided with a region of reduced cross-sectional area proximate the junction. See Figures 15 and 16 and also Figures 12 and 13 which show magnified views of junctions. As an example, a marked copy of Figure 13 of Griffiths is provided above (rejection of claim 1) with the junction identified, the cross section of the junction identified, and a microchannel having a reduced cross-sectional area proximate the junction that is less than the cross-sectional area of the junction.

Griffiths does not mention disposing a porous material in the embodiment shown in Figures 12, 13, 15, and 16; however, it would have been obvious to one with ordinary skill in the art at the time of the invention to do so because Griffiths discloses that the microchannel device

may be used for "electrochromatographic and electrophoretic separations, as well as pressure-driven chromatographic separation" and that porous material is useful in performing these separations. See col. 6;2-4 and col. 7:24-49.

For claim 22 note that granular material such as chromatographic beads are structures and furthermore Griffiths states, "[a]lternatively, the separation matrix used to increase the surface area may be a small-scale pattern or array of obstacles fabricated within the channel." See col. 7:49-51.

15. Claims 2, 5, 11, and 14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Christel et al. (US 6,368,871 B1) ("Christel").

Addressing claims 2 and 5, Christel discloses a microfluidic device (abstract), comprising

a microchannel system disposed on a substrate (Figure 1e), the microchannel system comprising at least two microchannels joined together to form a junction at their intersection (Figure 1e), wherein at least one of the microchannels has a reduced cross-sectional area proximate the junction that is less than the cross-sectional area of the junction (Figure 1e). Note that barring a contrary showing where the junction ends is essentially arbitrary. A marked copy of Figure 1e of Christel is provided below with the junction identified, the cross section of the

junction identified, and a microchannel having a reduced cross-sectional area proximate the junction that is less than the cross-sectional area of the junction.

Griffiths does not *mention* having the reduced effective cross-sectional area be about 10% that of the cross-sectional area of the microchannel. Christel also does not *mention* having the reduced effective cross-sectional area extend from the junction into the microchannel a distance of from about 05 to 4 microchannel. However, an embodiment meeting this limitation appears to be shown in Figures 1e and 1f. In any event, barring evidence to the contrary such as unexpected results, the dimensions, such as lengths or cross-sectional areas, of the junction and proximate microchannel is just a matter of optimizing the junction and proximate microchannel for the desired flow characteristics. As noted by Christel certain channel dimensions can cause turbulence or even mixing. See col. 4:9-28.

Addressing claims 11 and 14, Christel discloses a device for reducing sample dispersion (abstract) comprising

a first and second microchannel disposed on a substrate and intersecting to form a junction, wherein at least one of the first and second microchannels has a region of reduced effective cross-sectional area proximate the junction. See Figures 1e and 1f. Note that barring a contrary showing where the junction ends is essentially arbitrary. As an example, a marked copy of Figure 13 of Christel is provided above (rejection of claim 1) with the junction identified, the cross section of the junction identified, and a microchannel having a reduced cross-sectional area proximate the junction that is less than the cross-sectional area of the junction. Note since the structure of the claimed device is otherwise the same as that disclosed by Christel barring a

contrary showing the preamble limitation that the device is for reducing sample dispersion and cross-contamination is only an intended use that does patentably distinguish the claimed device from that disclosed by Christel.

Griffiths does not *mention* having the reduced effective cross-sectional area be about 10% that of the cross-sectional area of the microchannel. Christel also does not *mention* having the reduced effective cross-sectional area extend from the junction into the microchannel a distance of from about 05 to 4 microchannel. However, an embodiment meeting this limitation appears to be shown in Figures 1e and 1f. In any event, barring evidence to the contrary such as unexpected results, the dimensions, such as lengths or cross-sectional areas, of the junction and proximate microchannel is just a matter of optimizing the junction and proximate microchannel for the desired flow characteristics. As noted by Christel certain channel dimensions can cause turbulence or even mixing. See col. 4:9-28.

## *Claim Objections*

16. Claims 19 and 23 are objected to because of the following informalities:

a) Claim 19, line 11 -- a – should be inserted between "with" and "region"; and

b) Claim 23 ends with two periods.

Appropriate correction is required.

***Drawings***

17. The drawings were received on January 24, 2005. These drawings are accepted.

18. Any inquiry concerning this communication or earlier communications from the examiner should be directed to ALEX NOGUEROLA whose telephone number is (571) 272-1343. The examiner can normally be reached on M-F 8:30 - 5:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, NAM NGUYEN can be reached on (571) 272-1342. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Alex Noguerola
Primary Examiner
AU 1753
March 24, 2005